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§ 98. On the Calyptra in the Genus *Archidium*.—(In the year 1868, after long and patient search, I succeeded in finding the *Calyptra* in the genus *Archidium*. Previous to this it appears never to have been noticed by any one. I immediately communicated the discovery to Mr. Sullivant, presuming that he would give us a correct figure of this organ, and of its position with regard to the mature capsule, in his promised "Supplement to Icones Muscorum." But learning from Mr. Lesquereux that he left no notes or drawings on the subject, I have concluded to furnish for publication in the BULLETIN a synopsis of my own notes.)

In *Archidium Ohioense*, *Schimp.*, *A. alternifolium*, (*Brid.*) *Schimp.*, and *A. tenerrimum*, *Mitt.*, the only species of the genus known to me, almost immediately the capsule begins to form the calyptra ceases to develop, and, rupturing partly around the base, is quickly left at the base of the capsule, usually slightly adhering by a portion of its margin to the apex of the vaginula. It consists of a long style, slightly expanded and lobed at the base. The style at length becomes curved, much flattened and oblique by being crowded between the perichaetial leaves and the capsule; it is many times longer than in the genus *Sympoma*, Aust. (*Micromitrium*, Musc., Appalach.), while the expanded portion is equally as minute and as imperfectly developed. It occasionally ruptures, vertically, throughout nearly the whole length of the style; in this case a portion of it is left on either side at the base of the capsule.

C. F. A.

§ 99. *Rumex Patientia*, L.—This introduced species of *Rumex* appears to be little known, though it has been in the country for two hundred years. Is it actually rare, or has it commonly been overlooked? Our Manuals of Botany do not furnish us with much light on the subject. This plant has been known for a number of years in Amherst, Mass., and during the past three seasons we have found it not rarely in the neighboring towns, growing with *R. crispus* and *R. obtusifolius* under the same conditions and as thriftily as either of these species.

It is still more common at Highgate Springs, Vt., where for miles it may be seen on the roadside, and increasingly common as you cross the Canada line. Specimens from all these localities have been submitted to competent authority and determined.

Will not some of the readers of the BULLETIN interest themselves in the matter, and, by furnishing complete and mature specimens of all the less known *Rumices* in their vicinity, assist in determining more fully the range and character of the genus under consideration?

H. G. JESSUP, Amherst, Mass.

§ 100. Discharge of Pollen in the Paper Mulberry.—Some two years ago (vol. ii, No. 4), this subject was presented in the BULLETIN, by my father, Dr. Martin. I had myself never seen the phenomenon of the explosive discharge of pollen by this plant, and have consequently watched for it with much interest. This season, however, I have had the opportunity not only of witnessing, but of studying, the whole process.

It will be remembered that *Broussonetia papyrifera* is a diœcious

tree, the staminate catkins of which, produced in immense numbers, are loosely covered with the small apetalous, four-parted flowers. The fallen catkins always exhibit the opened calices, with the four stamens stretched out at full length and more or less reflexed.

On a warm morning, late in May, procuring a branch laden with catkins, from a cluster of young trees where the discharge was in full blast, I had repeated discharges take place while the branch was held in the hand. The catkins were not fully expanded yet, a few of the flowers only being open, with their reflexed and extended stamens, while the majority were closed or but half-opened. The latter showed the stamens coiled over in a twisted arch or bow, inwards and downwards, with the white anthers closely adjacent to each other in the bottom and centre of the calyx-cup. I fixed my eye on certain particular flowers, and watched them as long as I had time, in hopes of seeing the actual opening and discharge; but Nature will not hasten for our convenience. Other flowers would send off a puff; but all was done in an instant, and I had not my eye on the right one at the right time. Failing in this, I tried loosening a stamen of a nearly-open flower, with a pin. Instantly it sprang outward and backward, assuming the usual full-length reflexed position, and discharged its pollen in the manner observed, the anther-cells springing open at the same moment, and appearing empty as soon as the eye could note them. This I did over and over again, and always with the same result. In the still air of a room, the pollen-cloud from a single anther could be distinctly seen for about six inches from the point of discharge.

The anther-cells open at the same time with the springing out of the stamen; but whether in consequence of striking against the stalk and the adjacent flowers, or independently, could not be determined. They appear for a very short time like exquisite little valves of white silk, lustrous and delicate; but almost in a quarter of an hour they begin to show signs of fading, and speedily assume that withered aspect that is so familiar on the fallen catkins.

How far this whole phenomenon is familiar to botanists in general, I cannot say. Prof. Gray remarks of the section including this tree with *Morus* proper and *Maclura*, "filaments inflexed in the bud, spreading elastically when the calyx expands." The explosive discharge, however, does not seem to be familiarly recognized. It is about as complete and energetic a method for distributing the pollen so as to reach the fertile trees, as can well be imagined. The air around a staminate tree must be fairly charged with the grains for days; and the lightest wind must carry them to long distances. Unfortunately, the fertile trees are so scarce that, for the most part, all this activity is but wasting the pollen "on the desert air"; and I fear the species are dying out in the city, for it is only by offshoots that any new trees are produced.

It may be well to add that all the evidence shows the process to be purely mechanical, and in no way connected with any insect agency. There is nothing in these plain and odorless catkins to attract insects; and the discharge goes on in the room, or even in the hand, where no insect is near.

D. S. MARTIN,

June 25, 1874.

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